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Introduction to "*The Endangered Species Act at Thirty, Volume 2*"

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I Introduction

Frank W. Davis, J. Michael Scott, and Dale D. Goble

More than thirty years after its passage, the Endangered Species Act (ESA) of 1973 continues to be a cornerstone of U.S. biodiversity policy and among our most powerful environmental laws. The ESA set the nation's biodiversity conservation policy on a path that emphasized species-based conservation and triggered action only when a species faced imminent extinction. However, promoting recovery has proven more challenging than the original designers of the law anticipated. The number of listed species has mushroomed from 78 in 1973 to 1,267 in 2005, while in that time only 13 species have recovered sufficiently to be removed from the list (Scott et al. 2006).

As described in *The Endangered Species Act at 30: Renewing the Conservation Promise*, the act has proven remarkably durable in spite of nearly continuous political assaults and legal and scientific challenges (Goble et al. 2006). The contributing authors to that volume describe a variety of factors responsible for the act's endurance. Public support for species conservation has remained strong, especially for high-visibility species such as the bald eagle (*Haliaeetus leucocephalus*) and grizzly bear (*Ursus arctos horribilis*) but also for less-charismatic taxa. The act has been championed by environmental groups in part for its power to control development, a role supported by a majority of the American public (Czech and Krausman 1997). Reforms have also been important to the act's continuance. In particular, implementation has evolved over the years from an absolute prohibition on take of endangered species to a more flexible permitting system, thereby defusing potentially explosive conservation conflicts on private lands. The act has also catalyzed administrative and legal reforms at all levels of government that have led to positive changes in natural resource management in rural areas and in urban open space planning.

The future viability of the Endangered Species Act, however, is uncertain. Over the next few decades the sheer magnitude of the conservation challenge will almost certainly defy species-by-species conservation (Woodwell 2002). We now live in a human-dominated world of a rapidly changing climate and increasingly biologically impoverished ecosystems (Millennium Ecosystem

Assessment 2005a). As the conservation need grows, scientists have recommended putting more effort and resources toward protecting ecosystem services rather than simply preserving biodiversity for its own sake (Folke et al. 1996; Balvanera et al. 2001). This tension between investing in species for their intrinsic value versus their utility is likely to increase. The number of at-risk species in the United States is already five to ten times greater than the number of species currently protected under the ESA (Scott et al. 2006) and the gap will almost certainly continue to widen.

The cost of saving species must also be reevaluated. As our understanding of ecosystem dynamics and species requirements has improved, we see more clearly that our nature reserves are neither large enough nor represent environmental variation well enough to buffer species against continued habitat loss, degradation, or geographic displacement under climate change (Scott et al. 2001; Rosenzweig 2003a). Perhaps more to the point, many of the species at greatest risk are on private lands where political and economic costs of reserve-based species conservation are highest.

In other words, broad socioeconomic and environmental trends, combined with advances in conservation science, predict a rapidly widening gap between the goal of the Endangered Species Act, “to provide a means whereby the ecosystems upon which endangered species and threatened species depend, [and] to provide a program for the conservation of such endangered species and threatened species” (sec. 2(b)), versus what the law can actually deliver or what conservation scientists would argue is needed. For this reason, we believe an examination of the Endangered Species Act at thirty is not complete without revisiting some of the basic questions that pertain to U.S. policy for biodiversity conservation:

- What are we trying to protect and why?
- What are the limits of local species-based conservation for protecting biodiversity at multiple spatial scales and levels of organization?
- How can we conserve the biodiversity of the United States in increasingly human-dominated landscapes?
- Can we move beyond the tradition of biological reserves for rare and endangered species toward a conservation strategy that is more ecologically and economically viable?

The first volume, *The Endangered Species Act at 30: Renewing the Conservation Promise*, examined the implementation record, key actors and institutions, successes and failures, and opportunities to increase the act’s effectiveness. This companion volume examines the four questions posed above in more detail, offering perspectives from environmental philosophers, conservation biologists, ecologists, and economists. Together the two books present a thorough exami-

nation of America's most powerful environmental law at a critical juncture in its history.

Chapters are organized into three parts: "Conservation Goals," "Conservation Science," and "Conservation Policy and Management." Chapters in the first part examine the historical and philosophical underpinnings of nature conservation in general and species conservation in particular. In the second part, biogeographers, geneticists, ecologists, and conservation biologists consider biodiversity conservation at multiple scales and levels of organization, the effectiveness of the Endangered Species Act in protecting different kinds of biodiversity, and ways of improving the role of science in its implementation. Chapters in the third part examine prospects for conserving biodiversity in human-dominated ecosystems from economic, ecological, and social perspectives. The emphasis is on conserving biodiversity on private lands outside of nature reserves in urban and agricultural landscapes. Several chapters explore new approaches such as conservation banks and markets for species and ecosystem services.

The chapters in this volume are more technical than those in the first volume and readers may find the juxtaposition of so many disciplines thought provoking. Their scope varies widely. Some chapters are broad and conceptual while others more narrowly focus on specific aspects of conservation science or policy. The underlying theme throughout, however, is that biodiversity conservation in human-dominated landscapes requires a different mindset than the view prevailing in 1973. At the time, it was thought that single-species conservation could be achieved by "cease-and-desist" orders and nature set-asides; instead, we find ourselves in an increasingly complicated world of multispecies- and ecosystem-based conservation over large landscapes, active adaptive management of nature, and dynamic biodiversity markets.

Despite the extraordinary challenge of biodiversity conservation in the twenty-first century, however, the authors are decidedly positive and pragmatic in their outlooks. We hope that the reader will find, as we have, that the forward-looking ideas and approaches presented here create a sense of excitement and renewed hope for restoring and maintaining the diversity of nature in America.